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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/627,719	07/28/2003	Masaki Hashimoto	1114-185	7087
23117	7590	09/26/2005	EXAMINER	
NIXON & VANDERHYE, PC 901 NORTH GLEBE ROAD, 11TH FLOOR ARLINGTON, VA 22203			DOTE, JANIS L	
			ART UNIT	PAPER NUMBER
			1756	
DATE MAILED: 09/26/2005				

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/627,719

Applicant(s)

HASHIMOTO ET AL.

Examiner

Janis L. Dote

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 05 July 2005.
2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-6 is/are pending in the application.
4a) Of the above claim(s) _____ is/are withdrawn from consideration.
5) ☒ Claim(s) 2 is/are allowed.
6) ☒ Claim(s) 1 and 3-6 is/are rejected.
7) ☐ Claim(s) _____ is/are objected to.
8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
10) ☒ The drawing(s) filed on 28 July 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____

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1. A request for continued examination (RCE) under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicants' submission filed on Jul. 5, 2005, has been entered.

2. The examiner acknowledges the amendments to claims 1 and 2 set forth in the amendment filed on Jun. 2, 2005, which was entered upon the filing of the RCE. Claims 1-6 are pending.

3. The rejection of claim 2 under 35 U.S.C. 103(a) over Japanese Patent 2001-027815 (JP'815) combined with Japanese Patent 02-103556 (JP'556), set forth in the office action mailed on Mar. 3, 2005, paragraph 8, has been withdrawn in response to the amendment to claim 2 filed on Jun. 2, 2005, and entered upon the filing of the RCE. That amendment added the limitation of "preparing the conductive substrate so as to have a surface roughness caused by a cutting process" (emphasis added). As discussed in paragraph 8, JP'556 discloses roughening the surface of an aluminum substrate by grinding the surface with a

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particular grinding tape that is press-contacted to the surface of the substrate. Translation of JP'556, page 6, lines 14-21, and page 9, line 20, to page 10, line 8. JP'556 does not teach roughening the surface of a conductive substrate by a cutting method as recited in instant claim 2.

4. The examiner notes that the term "controlling means" recited in instant claim 2 is a means-plus-function limitation covered by 35 U.S.C. 112, sixth paragraph. No structure for said term is recited in the claims. The instant specification defines "controlling means" as a "processing circuit that can be implemented by a microcomputer in which a central processing unit (CPU) is mounted. The controlling means **28** includes, for example, Read Only Memory (ROM), and a controlling program for operating the controlling means **28** is previously stored in the ROM. According to the controlling program that is read from the ROM, the controlling means **28** outputs a controlling signal for controlling the rotational speed of the driving means **24** in response to the thickness of a layer that is the measurement result output from the spectrometer **27**." See the instant specification at page 30, line 24, to page 31, line 9, and Fig. 5.

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5. The examiner notes that the instant specification defines the term "maximum peak-to-valley roughness (R_y)" at page 20, lines 1-14, and "with reference to" Fig. 2.

The specification defines the term "centerline average roughness (R_a)" as the average of the absolute values of derivations from the average line m to the roughness curve. See the specification, page 20, line 23, to page 21, line 10.

The specification defines the term "ten-point average roughness (R_z)" at page 21, line 11, to page 22, line 1, and "with reference to" Fig. 3.

The specification defines the term "average peak-to-peak distance that is an average of a peak-to-peak distance of a cross-sectional curve (S_m)" at page 22, lines 8-14.

The specification defines the term "peak count P_c " at page 13, lines 4-10, and page 22, line 21, to page 23, line 12.

6. Claims 5 and 6 are objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicants are required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form.

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Claims 5 and 6 do not further limit the peak count Pc recited in instant claims 1 and 3, from which claims 5 and 6 depend, respectively, because claims 5 and 6 merely recite the definition of the peak count Pc. See the instant specification, page 13, lines 4-10, and page 22, line 21, to page 23, line 12. For example, the specification at page 13, lines 6-10, states that the peak count Pc "is a value obtained by counting the number of peaks having a height of at least the predetermined width of the top point and the bottom point in the reference length . . . ," which is the limitation recited in instant claims 5 and 6.

Applicants' arguments filed on Jun. 2, 2005, have been fully considered but they are not persuasive.

Applicants argue that there are differences between claims 1 and 2 and claims 5 and 6. Applicants assert that it is not proper to read limitations from the specification into the claims as the Office action appears to do in connection with the improper objection to claims 5 and 6.

However, instant claims 1 and 2 do not define the term "peak count Pc" within the four corners of the claims. When the specification provides definitions for terms appearing in the claims, the specification can be used in interpreting the claims. See In re Vogel, 164 USPQ 619, 622 (CCPA 1970). "When

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the applicant states the meaning that the claim terms are intended to have, the claims are examined with that meaning, in order to achieve a complete exploration of the applicant's invention and its relation to the prior art." In re Zletz, 13 USPQ2d 1320, 1322 (Fed. Cir. 1989). As noted in paragraph 5 above, the specification defines the term "peak count Pc" at page 13, lines 4-10. The specification at page 13, lines 4-10, states that "herein, the peak count Pc is an index of the surface roughness according to a parameter PPI defined in JJ911-1986 of the Society of Automotive Engineers (SAE) Standard and is a value obtained by counting the number of peaks having a height of at least the predetermined width of the top point and the bottom point in the reference length described above" (emphasis added). Instant claims 5 and 6 recite that "the peak count Pc is obtained by counting the number of peaks which have a height equal to or more than a predetermined width from a top point to a bottom point in a reference length." The definition of the peak count Pc recited in claims 5 and 6 appears to be broader than the definition disclosed in the specification. Furthermore, applicants have not clearly stated how the term "peak count Pc" recited in instant claims 5 and 6 differs from the term "peak count Pc" recited in instant claims 1 and 2 as defined in the instant specification.

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7. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

8. Claims 1 and 5 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Japanese Patent 02-103556 (JP'556), as evidenced by applicants' admissions at page 19, lines 9-16, and page 23, lines 20-22, of the instant specification (applicants' admission I). See the USPTO English-language translation of JP'556 for cites.

JP'556 discloses an electrophotographic photoreceptor comprising a conductive substance and a photosensitive layer on the substrate. The conductive substrate has a surface roughness having a maximum height R_{max} (i.e., R_y) of 0.8 to 1.0 μm , a R_a of 0.12 to 0.15 μm , a R_z of 0.78 to 0.98 μm , and a S_m of 9 to 11 μm . Translation, page 10, lines 9-22. The values of R_{max} , R_a , R_z , and S_m are within the ranges recited in instant claim 1.

JP'556 does not disclose that the conductive substrate has a peak count P_c of 60 to 100 as recited in instant claims 1 and 5. However, as discussed supra, the conductive substrate has a surface roughness that meets the roughness parameters R_y , R_a , R_z , and S_m recited in instant claim 1. JP'556 also discloses that when the photoreceptor is exposed to a single

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wavelength light, no interference fringes were observed. JP'556 further discloses that the photoreceptor provided images without white voids and black spots. Translation, page 11, lines 3-12. The instant specification at page 23, lines 20-22, discloses that when the conductive substrate has a peak count P_c of less than 60 and the number of the peaks having large irregularities is small, interference fringes are generated in image formation. Thus, because the conductive substrate disclosed by JP'556 has a surface roughness that meets the surface roughness parameters R_y , R_a , R_z , and S_m , and appears to have the properties sought by applicants, it is reasonable to presume that the conductive substrate disclosed by JP'556 has a surface roughness peak count P_c that is within the range recited instant claim 1. The burden is on applicants to prove otherwise. In re Fitzgerald, 205 USPQ 594 (CCPA 1980).

The recitation "the surface roughness of the conductive substrate caused by a cutting process" is written in product-by-process format. JP'556 does not disclose that the surface roughness of its conductive substrate is "caused by a cutting process" as recited in instant claim 1. However, the instant specification at page 19, lines 9-16, discloses that a conductive substrate having the surface roughness characteristics recited in the instant claims can be obtained by

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a number of methods, which include, in addition to cutting, for example, honing, etching, grinding, laser irradiation, and oxidation treatment. JP'556 teaches that its conductive substrate is subjected to a grinding method wherein the surface of an aluminum substrate is ground with a particular grinding tape that is press-contacted to the surface of the substrate.

Translation of JP'556, page 6, lines 14-21, and page 9, line 20, to page 10, line 8. Furthermore, as discussed above, the JP'556 conductive substrate has a surface roughness that meets the surface roughness parameters R_y , R_a , R_z , and S_m . For the reasons discussed above, it is also reasonable to presume that the conductive substrate disclosed by JP'556 has a surface roughness peak count P_c that is within the range recited instant claims 1 and 5. Thus, it appears that the conductive substrate disclosed by JP'556 is the same or substantially the same as the conductive substrate made by the process recited in the instant claims. The burden is on applicants to prove otherwise. In re Marosi, 218 USPQ 289 (Fed. Cir. 1983); In re Thorpe, 227 USPQ 964 (Fed. Cir. 1985); MPEP 2113.

The recitation "being exposed to coherent light" in instant claim 1 is a statement of intended use, which does not distinguish the photoreceptor disclosed in JP'556. The recitation of the intended use must result in a structural

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difference between the claimed invention and the prior art or in a process, a manipulative difference, in order to patentably distinguish the claimed invention from the prior art. See In re Casey, 152 USPQ 235 (CCPA 1967) and In re Otto, 136 USPQ 458, 459 (CCPA 1963).

9. Claims 3, 4, and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over US 6,239,824 B1 (Mutou) combined with JP'556. See the USPTO translation of JP'556 for cites.

Mutou discloses an image forming apparatus comprising an electrophotographic photoreceptor **10** and an exposure unit **15**. Col. 4, lines 10-17, and Fig. 1. The exposure unit **15** comprises an infrared semiconductor laser **20**, which emits light having a wavelength of 780 nm. Col. 4, lines 43-46, and Fig. 2. The exposure unit **15** can form electrostatic latent images having a resolution of 1200 dpi. Col. 5, lines 50-54, and col. 6, lines 35-38. The exposure unit **15** meets the exposure apparatus limitations recited in instant claims 3 and 4.

Mutou discloses that the photoreceptor comprises a conductive substrate, an undercoat layer, a charge generation layer, and a charge transport layer. Col. 4, lines 29-34. However, Mutou does not disclose that the conductive substrate has a surface roughness as recited in the instant claims.

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JP'556 discloses an aluminum substrate having a surface roughness having a maximum height R_{max} (i.e., R_y) of 0.8 to 1.0 μm , a R_a of 0.12 to 0.15 μm , a R_z of 0.78 to 0.98 μm , and a S_m of 9 to 11 μm . According to JP'556, a photoreceptor comprising the aluminum substrate disclosed by JP'556 provides images with stable image density without the occurrence of any image flaws, such as scratches, white voids, and black dots, or the development of interference fringes. The discussion of JP'556 in paragraph 8 above is incorporated herein by reference.

It would have been obvious for a person having ordinary skill in the art, in view of the teachings of JP'556, to use the conductive substrate taught by JP'556 as the conductive substrate in the photoreceptor in the image forming apparatus disclosed by Mutou, because that person would have had a reasonable expectation of successfully obtaining an image forming apparatus that provides images with stable image density without the occurrence of any image flaws, such as scratches, white voids, and black dots, or the development of interference fringes.

The recitation "for being exposed to coherent light" in the instant claims is a statement of intended use, which does not distinguish the photoreceptor rendered obvious over the combined teachings of Mutou and JP'556. The recitation of the intended

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use must result in a structural difference between the claimed invention and the prior art or in a process, a manipulative difference, in order to patentably distinguish the claimed invention from the prior art. See In re Casey, 152 USPQ 235 (CCPA 1967) and In re Otto, 136 USPQ 458, 459 (CCPA 1963). As discussed above, the photoreceptor rendered obvious over the combined teachings of the cited prior art appears to meet the compositional limitations recited in the instant claim. Thus, the intended use recited in the instant claim does not result in a difference between the photoreceptor recited in the instant claim and the photoreceptor rendered obvious over the combined teachings in the cited prior art.

10. Applicants' arguments filed on Jun. 2, 2005, with respect to the rejections over JP'556 in paragraphs 8 and 9 above have been fully considered but they are not persuasive.

Applicants assert that the grinding method disclosed in JP'556 "is fundamentally different from the cutting process called for in amended claim 1." Applicants further assert that the "process with a grinding tape, as compared with a cutting tool, exhibits considerable variations in surface condition due to structural differences between the grinding tape and the cutting tool . . . and uniform surface properties cannot be

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obtained over the entire surface of the substrate." Applicants conclude that the "values of 'peak count Pc' fluctuate too much in some places of JP'556," while when a cutting process is used as recited in claim 1, "a remarkable advantageous effect of stable surface property is obtained over the surface of the substrate."

Applicants' assertions are mere attorney argument. There is no objective evidence in the present record to support applicants' assertions. As discussed in paragraph 8 above, the instant specification at page 19, lines 9-16, discloses that a conductive substrate having the surface roughness characteristics recited in the instant claims can be obtained by at least thirteen methods, which include, in addition to cutting, for example, honing, etching, grinding, and laser irradiation. The instant specification does not disclose that a cutting process provides "a remarkable advantageous effect of stable surface property" over the other twelve disclosed methods. Applicants have not met their burden to show that the JP'556 conductive substrate made by the grinding method disclosed by JP'556 is not the same or substantially the same as the conductive substrate made by the cutting process recited in instant claim 1. Accordingly, the rejections over JP'556 stand.

Applicants further assert that the Pc recited in the instant claims is not inherent in JP'556. Applicants assert that the presence of no interference fringe cannot be used to argue that a Pc of from 60-100 is inherent in JP'556. Applicants refer to the disclosure in the specification at page 10, line 25, to page 12, line 27, to support their assertions.

Applicants' assertions are not persuasive. Although applicants are trying to measure the thickness of photosensitive layers in a photoreceptor by optical interferometry, applicants are also trying to prevent the occurrence of interference fringes when the photoreceptor is exposed to a light source in an image forming apparatus. The specification at page 9, lines 9-15, discloses that when the spot diameter of the exposing light is reduced, "the interference fringes may occur, regardless of the rough surface of the substrate of the electrophotographic photoreceptor. Therefore, when the spot diameter of light is small, the surface roughness of the substrate tends to be made rougher in order to prevent interference fringes from occurring." However, as noted by applicants, the specification, at page 11, lines 10-14, states that "for interference fringes occurring in the images formed in an image forming apparatus having a small light spot, it is

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difficult to correlate the occurrence of interference fringes and the surface roughness only with R_y , R_a , R_z and Sm ." The specification at page 11, lines 14-21, states that the correlation between the occurrence of the interference fringes and the surface roughness can be "clarified" when a peak count P_c is used with the four parameters R_y , R_a , R_z , and Sm of the substrate surface. The specification at page 11, lines 21-23, further states that "the occurrence of the interference fringes is prevented by limiting R_y , R_a , R_z , Sm , and P_c to be within a preferable range." Although the specification at page 11, line 23, to page 12, line 1, discloses that said prevention makes it possible to measure the thickness of a photosensitive layer with high precision by optical interferometry in the area of having rough surface roughness, which is a property sought by applicants, the specification still discloses that the occurrence of the interference fringes using an exposure unit with a "small light spot" can be "prevented by limiting R_y , R_a , R_z , Sm , and P_c to be within a preferable range." As discussed in the rejections in paragraphs 8 and 9 above, the instant specification at page 23, lines 20-22, further discloses that when the conductive substrate has a peak count P_c of less than 60 and the number of the peaks having large irregularities is small, interference fringes are generated in image formation.

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Although JP'556 is silent with respect to measuring the thickness of a photosensitive layer with high precision by optical interferometry, as discussed in paragraphs 8 and 9 above, JP'556 discloses that when a photoreceptor comprising the JP'556 aluminum substrate as the conductive substrate is exposed to a single wavelength light, no interference fringes were observed. JP'556 discloses that light of a single wavelength can be provided by a laser beam. Translation, page 3, line 12. JP'556 further discloses that when photosensitive bodies are used in image forming apparatuses using a single wavelength light, "it is necessary to moderately roughen the surface of the base substance [of photosensitive bodies] so that interference fringes do not develop in the image." Translation, page 3, lines 13-16. JP'556 appears to be also concerned with preventing the occurrence of interference fringes in imaging apparatuses using small spot diameters of light, which also a property sought by applicants. Thus, for the reasons discussed in the rejections in paragraphs 8 and 9 above, it is reasonable to presume that the conductive substrate disclosed by JP'556 has a surface roughness peak count P_c that is within the range recited instant claims 1, 5, and 6. Applicants have not met their burden to show otherwise. Accordingly, the rejections stand.

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11. Claim 2 is allowable over the prior art of record for the reasons discussed in paragraph 3, supra, which are incorporated herein by reference.

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Janis L. Dote whose telephone number is (571) 272-1382. The examiner can normally be reached Monday through Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mr. Mark Huff, can be reached on (571) 272-1385. The central fax phone number is (571) 203-8300.

Any inquiry regarding papers not received regarding this communication or earlier communications should be directed to Supervisory Application Examiner Ms. Claudia Sullivan, whose telephone number is (571) 272-1052.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

JLD
Sep. 17, 2005

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